

SUPPLEMENTARY TABLE 3. Targeted analysis of metabolic genes.

Genes identified within enriched GO metabolic terms with nucleosome number for LF, HF and HF+NaB. Only those genes with the same nucleosome number between LF and HF+NaB, but ≥ 2 nucleosome number difference from HF are listed. Genes are listed in alphabetical order by gene description.

EntrezID	Gene Symbol	Gene Description	LF	HF	HF+NaB
56794	Hacl1	2-hydroxyacyl-CoA lyase 1	83	76	83
66627	Ogfod2	2-oxoglutarate and iron-dependent oxygenase domain cont	22	24	22
227095	Hibch	3-hydroxyisobutyryl-Coenzyme A hydrolase	177	180	177
67432	Hoga1	4-hydroxy-2-oxoglutarate aldolase 1	22	19	22
242642	Hpd1	4-hydroxyphenylpyruvate dioxygenase-like	89	85	89
382007	Adam26b	a disintegrin and metallopeptidase domain 26B	346	356	346
353188	Adam32	a disintegrin and metallopeptidase domain 32	239	243	239
279028	Adamts13	a disintegrin-like and metallopeptidase (reprolysin type) with	58	60	58
108153	Adamts7	a disintegrin-like and metallopeptidase (reprolysin type) with	197	200	197
101401	Adamts9	a disintegrin-like and metallopeptidase (reprolysin type) with	298	302	298
113868	Acaa1a	acetyl-Coenzyme A acyltransferase 1A	20	24	20
226250	Afap1l2	actin filament associated protein 1-like 2	315	325	315
11538	Adnp	activity-dependent neuroprotective protein	191	183	191
233799	Acsm2	acyl-CoA synthetase medium-chain family member 2	129	131	129
80911	Acox3	acyl-Coenzyme A oxidase 3, pristanoyl	136	130	136
114896	Afg3l1	AFG3(ATPase family gene 3)-like 1 (yeast)	92	94	92
11611	Agxt	alanine-glyoxylate aminotransferase	74	76	74
79459	Aldoart2	aldolase 1 A retrogene 2	139	134	139
245847	Amdhd2	amidohydrolase domain containing 2	37	35	37
235386	Agphd1	aminoglycoside phosphotransferase domain containing 1	108	110	108
17025	Alad	aminolevulinate, delta-, dehydratase	26	29	26
14797	Aes	amino-terminal enhancer of split	34	32	34
11820	App	amyloid beta (A4) precursor protein	911	931	911
11730	Ang3	angiogenin, ribonuclease A family, member 3	43	45	43
11607	Agtr1a	angiotensin II receptor, type 1a	516	520	516
103161	Apof	apolipoprotein F	23	20	23
11690	Alox5ap	arachidonate 5-lipoxygenase activating protein	268	260	268
57344	As3mt	arsenic (+3 oxidation state) methyltransferase	91	94	91
68865	Arv1	ARV1 homolog (yeast)	41	38	41
11865	Arntl	aryl hydrocarbon receptor nuclear translocator-like	539	541	539
67758	Aadac	arylacetamide deacetylase (esterase)	85	91	85
11298	Aanat	arylalkylamine N-acetyltransferase	55	52	55
102580	Alg9	asparagine-linked glycosylation 9 homolog (yeast, alpha 1,2	114	105	114
110616	Atxn3	ataxin 3	82	84	82
28080	Atp5o	ATP synthase, H ⁺ transporting, mitochondrial F1 complex, C	420	422	420
76223	Agbl3	ATP/GTP binding protein-like 3	188	190	188
231093	Agbl5	ATP/GTP binding protein-like 5	48	51	48
11983	Atpif1	ATPase inhibitory factor 1	30	36	30
74104	Abcb6	ATP-binding cassette, sub-family B (MDR/TAP), member 6	26	30	26
12053	Bcl6	B-cell leukemia/lymphoma 6	585	604	585
12028	Bax	BCL2-associated X protein	34	32	34
20997	T	brachyury	563	543	563
210766	Brcc3	BRCA1/BRCA2-containing complex, subunit 3	111	118	111
12229	Btk	Bruton agammaglobulinemia tyrosine kinase	54	51	54
232430	Crebl2	cAMP responsive element binding protein-like 2	123	127	123
59031	Chst12	carbohydrate sulfotransferase 12	188	180	188

76459	Car12	carbonic anhydrase 12	267	258	267
72361	Ces2g	carboxylesterase 2G	129	125	129
70574	Cpm	carboxypeptidase M	431	435	431
80794	Cblc	Casitas B-lineage lymphoma c	65	68	65
12371	Casp9	caspase 9	44	47	44
214932	Cecr5	cat eye syndrome chromosome region, candidate 5 homolog	224	228	224
13035	Ctsg	cathepsin G	44	48	44
13038	Ctsk	cathepsin K	120	122	120
72068	Cnot2	CCR4-NOT transcription complex, subunit 2	541	539	541
69125	Cnot8	CCR4-NOT transcription complex, subunit 8	211	202	211
70333	Cd3eap	CD3E antigen, epsilon polypeptide associated protein	22	18	22
226751	Cdc42bpa	CDC42 binding protein kinase alpha	490	493	490
68379	Ciz1	CDKN1A interacting zinc finger protein 1	34	31	34
226527	BC026585	cDNA sequence BC026585	125	116	125
99151	Cercam	cerebral endothelial cell adhesion molecule	59	55	59
12647	Chat	choline acetyltransferase	68	66	68
12651	Chkb	choline kinase beta	34	32	34
99712	Cept1	choline/ethanolaminephosphotransferase 1	76	84	76
27221	Chaf1a	chromatin assembly factor 1, subunit A (p150)	51	54	51
30951	Cbx8	chromobox homolog 8 (Drosophila Pc class)	71	67	71
66473	Ctrb1	chymotrypsinogen B1	119	117	119
269582	Clspn	claspin homolog (Xenopus laevis)	101	95	101
59035	Carm1	coactivator-associated arginine methyltransferase 1	90	82	90
14068	F7	coagulation factor VII	114	108	114
71743	Coasy	Coenzyme A synthase	10	12	10
227683	Coq4	coenzyme Q4 homolog (yeast)	20	22	20
58202	Cobra1	cofactor of BRCA1	23	18	23
12696	Cirbp	cold inducible RNA binding protein	26	29	26
109791	Clps	colipase, pancreatic	38	33	38
12263	C2	complement component 2 (within H-2S)	42	48	42
26891	Cops4	COP9 (constitutive photomorphogenic) homolog, subunit 4 (92	101	92
12953	Cry2	cryptochrome 2 (photolyase-like)	76	73	76
13048	Cux2	cut-like homeobox 2	319	316	319
12537	Cdk11b	cyclin-dependent kinase 11B	66	68	66
228714	Csrp2bp	cysteine and glycine-rich protein 2 binding protein	115	119	115
83429	Ctns	cystinosis, nephropathic	31	29	31
225912	Cybas3	cytochrome b, ascorbate dependent 3	35	37	35
13098	Cyp2c39	cytochrome P450, family 2, subfamily c, polypeptide 39	233	241	233
13107	Cyp2f2	cytochrome P450, family 2, subfamily f, polypeptide 2	162	167	162
13109	Cyp2j5	cytochrome P450, family 2, subfamily j, polypeptide 5	255	252	255
71519	Cyp2u1	cytochrome P450, family 2, subfamily u, polypeptide 1	91	89	91
13096	Cyp2c37	cytochrome P450, family 2. subfamily c, polypeptide 37	237	244	237
13194	Ddb1	damage specific DNA binding protein 1	39	34	39
74351	Ddx23	DEAD (Asp-Glu-Ala-Asp) box polypeptide 23	58	55	58
13207	Ddx5	DEAD (Asp-Glu-Ala-Asp) box polypeptide 5	5	7	5
13211	Dhx9	DEAH (Asp-Glu-Ala-His) box polypeptide 9	175	165	175
69305	Dcps	decapping enzyme, scavenger	109	104	109
68087	Dcakd	dephospho-CoA kinase domain containing	79	83	79
109620	Dsp	desmoplakin	214	216	214
13544	Dvl3	dishevelled 3, dsh homolog (Drosophila)	44	42	44
55947	Dclre1a	DNA cross-link repair 1A, PSO2 homolog (S. cerevisiae)	112	121	112
71712	Dram1	DNA-damage regulated autophagy modulator 1	233	238	233

58233	Dnaja4	DnaJ (Hsp40) homolog, subfamily A, member 4	90	94	90
27389	Dusp13	dual specificity phosphatase 13	55	53	55
83965	Enpp5	ectonucleotide pyrophosphatase/phosphodiesterase 5	200	197	200
50701	Elane	elastase, neutrophil expressed	14	12	14
106389	Eaf2	ELL associated factor 2	148	144	148
14791	Emg1	EMG1 nucleolar protein homolog (<i>S. cerevisiae</i>)	67	65	67
13587	Ear2	eosinophil-associated, ribonuclease A family, member 2	130	132	130
386655	Eid2	EP300 interacting inhibitor of differentiation 2	121	128	121
13836	Epha2	Eph receptor A2	158	154	158
13684	Eif4e	eukaryotic translation initiation factor 4E	49	51	49
208691	Eif5a2	eukaryotic translation initiation factor 5A2	131	138	131
211651	Fancd2	Fanconi anemia, complementation group D2	91	94	91
13163	Daxx	Fas death domain-associated protein	30	32	30
69577	Fastkd3	FAST kinase domains 3	20	22	20
50754	Fbxw7	F-box and WD-40 domain protein 7	558	560	558
230903	Fbxo44	F-box protein 44	7	9	7
231630	Ficd	FIC domain containing	61	57	61
14225	Fkbp1a	FK506 binding protein 1a	104	99	104
14313	Fst	follistatin	530	549	530
15377	Foxa3	forkhead box A3	28	25	28
74123	Foxp4	forkhead box P4	336	322	336
14239	Foxs1	forkhead box S1	50	48	50
238024	Fn3krp	fructosamine 3 kinase related protein	66	62	66
68126	Fahd2a	fumarylacetoacetate hydrolase domain containing 2A	74	76	74
28030	Gfm1	G elongation factor, mitochondrial 1	113	109	113
14772	Grk4	G protein-coupled receptor kinase 4	131	133	131
26431	Git2	G protein-coupled receptor kinase-interactor 2	81	86	81
74246	Gale	galactose-4-epimerase, UDP	31	28	31
11605	Gla	galactosidase, alpha	17	20	17
207182	Ggt7	gamma-glutamyltransferase 7	100	103	100
331026	Gmppb	GDP-mannose pyrophosphorylase B	67	64	67
209357	Gtf2h3	general transcription factor IIH, polypeptide 3	27	29	27
233863	Gtf3c1	general transcription factor III C 1	134	136	134
26384	Gnpda1	glucosamine-6-phosphate deaminase 1	164	159	164
14377	G6pc	glucose-6-phosphatase, catalytic	115	113	115
328232	Gfod1	glucose-fructose oxidoreductase domain containing 1	256	265	256
14415	Gad1	glutamic acid decarboxylase 1	192	196	192
76282	Gpt	glutamic pyruvic transaminase, soluble	33	37	33
14858	Gsta2	glutathione S-transferase, alpha 2 (<i>Yc2</i>)	55	51	55
14863	Gstm2	glutathione S-transferase, mu 2	65	59	65
14869	Gstp2	glutathione S-transferase, pi 2	30	28	30
103140	Gstt3	glutathione S-transferase, theta 3	33	37	33
14433	Gapdh	glyceraldehyde-3-phosphate dehydrogenase	53	47	53
14626	Gk2	glycerol kinase 2	807	795	807
68133	Gcsh	glycine cleavage system protein H (aminomethyl carrier)	137	130	137
71103	Glt6d1	glycosyltransferase 6 domain containing 1	63	60	63
11692	Gfer	growth factor, erv1 (<i>S. cerevisiae</i>)-like (augmenter of liver re	6	8	6
14710	Gngt2	guanine nucleotide binding protein (G protein), gamma trans	117	115	117
14917	Gucy2c	guanylate cyclase 2c	176	186	176
15372	Hmx2	H6 homeobox 2	17	19	17
72748	Hdhd3	haloacid dehalogenase-like hydrolase domain containing 3	50	54	50
15510	Hspd1	heat shock protein 1 (chaperonin)	45	43	45

15381 Hnrnpc	heterogeneous nuclear ribonucleoprotein C	56	58	56
212032 Hk3	hexokinase 3	193	189	193
234219 Helt	Hey-like transcription factor (zebrafish)	330	322	330
15353 Hmg20b	high mobility group 20 B	14	18	14
107435 Hat1	histone aminotransferase 1	110	116	110
15425 Hoxc6	homeobox C6	28	25	28
15258 Hipk2	homeodomain interacting protein kinase 2	367	365	367
15259 Hipk3	homeodomain interacting protein kinase 3	207	202	207
239099 Homez	homeodomain leucine zipper-encoding gene	130	132	130
215114 Hip1	huntingtin interacting protein 1	222	211	222
15493 Hsd3b2	hydroxy-delta-5-steroid dehydrogenase, 3 beta- and steroid	145	158	145
15452 Hprt	hypoxanthine guanine phosphoribosyl transferase	162	177	162
16151 Ikbkg	inhibitor of kappaB kinase gamma	161	150	161
114663 Impa2	inositol (myo)-1(or 4)-monophosphatase 2	127	119	127
16337 Insr	insulin receptor	799	806	799
229543 Ints3	integrator complex subunit 3	100	91	100
109077 Ints5	integrator complex subunit 5	10	12	10
16398 Itga2	integrin alpha 2	344	363	344
54131 Irf3	interferon regulatory factor 3	22	19	22
16180 Il1rap	interleukin 1 receptor accessory protein	581	592	581
16186 Il2rg	interleukin 2 receptor, gamma chain	14	12	14
381314 Iars2	isoleucine-tRNA synthetase 2, mitochondrial	21	23	21
108829 Jmjd1c	jumonji domain containing 1C	236	244	236
18050 Kik1b3	kallikrein 1-related peptidase b3	21	25	21
16622 Kik1b5	kallikrein 1-related peptidase b5	24	27	24
16542 Kdr	kinase insert domain protein receptor	763	789	763
16591 Kl	klotho	670	665	670
21847 Klf10	Kruppel-like factor 10	383	395	383
66277 Klf15	Kruppel-like factor 15	156	144	156
235435 Lctl	lactase-like	204	199	204
93898 Lass1	LAG1 homolog, ceramide synthase 1	17	19	17
107515 Lgr4	leucine-rich repeat-containing G protein-coupled receptor 4	130	138	130
17001 Ltc4s	leukotriene C4 synthase	90	83	90
16909 Lmo2	LIM domain only 2	310	328	310
64899 Lpin3	lipin 3	66	64	66
16803 Lbp	lipopolysaccharide binding protein	135	138	135
16956 Lpl	lipoprotein lipase	371	368	371
78913 Ltn1	listerin E3 ubiquitin protein ligase 1	110	115	110
16973 Lrp5	low density lipoprotein receptor-related protein 5	167	163	167
67684 Luc7l3	LUC7-like 3 (S. cerevisiae)	117	112	117
70902 Lpcat2b	lysophosphatidylcholine acyltransferase 2B	124	118	124
17105 Lyz2	lysozyme 2	68	75	68
15235 Mst1	macrophage stimulating 1 (hepatocyte growth factor-like)	20	18	20
17195 Mbl2	mannose-binding lectin (protein C) 2	456	461	456
73744 Man2c1	mannosidase, alpha, class 2C, member 1	92	89	92
17346 Mknk1	MAP kinase-interacting serine/threonine kinase 1	74	72	74
433586 Maml3	mastermind like 3 (Drosophila)	780	767	780
17285 Meox1	mesenchyme homeobox 1	229	239	229
17768 Mthfd2	methylenetetrahydrofolate dehydrogenase (NAD+ depende	118	121	118
72096 Mettl10	methyltransferase like 10	58	62	58
387191 Mir196a-1	microRNA 196a-1	24	22	24
723965 Mirlet7a-2	microRNA let7a-2	64	67	64

70478	Mipep	mitochondrial intermediate peptidase	345	350	345
66845	Mrpl33	mitochondrial ribosomal protein L33	226	221	226
66973	Mrps18b	mitochondrial ribosomal protein S18B	7	9	7
76784	Mtif2	mitochondrial translational initiation factor 2	43	41	43
26417	Mapk3	mitogen-activated protein kinase 3	80	78	80
50772	Mapk6	mitogen-activated protein kinase 6	126	122	126
26403	Map3k11	mitogen-activated protein kinase kinase kinase 11	16	11	16
26405	Map3k2	mitogen-activated protein kinase kinase kinase 2	124	131	124
26407	Map3k4	mitogen-activated protein kinase kinase kinase 4	331	334	331
18198	Musk	muscle, skeletal, receptor tyrosine kinase	299	307	299
17188	Maz	MYC-associated zinc finger protein (purine-binding transcrip	21	19	21
17874	Myd88	myeloid differentiation primary response gene 88	47	42	47
381022	Mll2	myeloid/lymphoid or mixed-lineage leukemia 2	61	56	61
238564	Mylk4	myosin light chain kinase family, member 4	601	603	601
17888	Myh6	myosin, heavy polypeptide 6, cardiac muscle, alpha	25	23	25
217127	Myst2	MYST histone acetyltransferase 2	102	96	102
70088	Meaf6	MYST/Esa1-associated factor 6	83	78	83
68043	N6amt2	N-6 adenine-specific DNA methyltransferase 2 (putative)	178	190	178
242864	Napepld	N-acyl phosphatidylethanolamine phospholipase D	117	115	117
71950	Nanog	Nanog homeobox	107	114	107
234664	Nae1	NEDD8 activating enzyme E1 subunit 1	41	38	41
17966	Nbr1	neighbor of Brca1 gene 1	40	43	40
18010	Neu1	neuraminidase 1	44	50	44
56802	Nespas	neuroendocrine secretory protein antisense	17	15	17
11922	Neurod6	neurogenic differentiation 6	484	490	484
225872	Npas4	neuronal PAS domain protein 4	81	71	81
18211	Ntrk1	neurotrophic tyrosine kinase, receptor, type 1	31	33	31
59125	Nek7	NIMA (never in mitosis gene a)-related expressed kinase 7	721	727	721
18126	Nos2	nitric oxide synthase 2, inducible	201	206	201
18035	Nfkbia	nuclear factor of kappa light polypeptide gene enhancer in B	212	208	212
22259	Nr1h3	nuclear receptor subfamily 1, group H, member 3	23	26	23
20186	Nr1h4	nuclear receptor subfamily 1, group H, member 4	269	265	269
78688	Nol3	nucleolar protein 3 (apoptosis repressor with CARD domain)	20	25	20
68219	Nudt21	nudix (nucleoside diphosphate linked moiety X)-type motif 2	30	33	30
69917	Obfc2b	oligonucleotide/oligosaccharide-binding fold containing 2B	12	15	12
67013	Oma1	OMA1 homolog, zinc metallopeptidase (S. cerevisiae)	1382	1390	1382
107260	Otub1	OTU domain, ubiquitin aldehyde binding 1	133	130	133
107586	Ovol2	ovo-like 2 (Drosophila)	128	131	128
18609	Pdx1	pancreatic and duodenal homeobox 1	157	147	157
74450	Pank2	pantothenate kinase 2	70	74	70
214627	Papd5	PAP associated domain containing 5	173	171	173
23850	Pappa2	pappalysin 2	943	934	943
18483	Palm	paralemmin	34	38	34
73078	Pmpcb	peptidase (mitochondrial processing) beta	108	106	108
242377	Pm20d2	peptidase M20 domain containing 2	95	90	95
18626	Per1	period homolog 1 (Drosophila)	35	40	35
226169	Pprc1	peroxisome proliferative activated receptor, gamma, coactiv.	42	38	42
64934	Pes1	pescadillo homolog 1, containing BRCT domain (zebrafish)	64	71	64
74016	Phf19	PHD finger protein 19	108	110	108
68479	Phf5a	PHD finger protein 5A	21	23	21
241489	Pde11a	phosphodiesterase 11A	484	481	484
70974	Pgm2l1	phosphoglucomutase 2-like 1	104	102	104

30955	Pik3cg	phosphoinositide-3-kinase, catalytic, gamma polypeptide	401	413	401
240752	Pik3c2b	phosphoinositide-3-kinase, class 2, beta polypeptide	135	131	135
18778	Pla2g1b	phospholipase A2, group IB, pancreas	67	74	67
18782	Pla2g2d	phospholipase A2, group IID	79	76	79
329502	Pla2g4e	phospholipase A2, group IVE	175	178	175
53357	Pla2g6	phospholipase A2, group VI	82	79	82
66857	Plbd1	phospholipase B domain containing 1	343	347	343
71772	Plbd2	phospholipase B domain containing 2	38	40	38
18830	Pltp	phospholipid transfer protein	62	58	62
14450	Gart	phosphoribosylglycinamide formyltransferase	35	39	35
18969	Pola2	polymerase (DNA directed), alpha 2	83	79	83
18970	Polb	polymerase (DNA directed), beta	90	88	90
18975	Polg	polymerase (DNA directed), gamma	146	142	146
73826	Poldip3	polymerase (DNA-directed), delta interacting protein 3	32	35	32
67065	Polr3d	polymerase (RNA) III (DNA directed) polypeptide D	20	18	20
18991	Pou3f1	POU domain, class 3, transcription factor 1	999	972	999
80720	Pbx4	pre-B-cell leukemia homeobox 4	90	86	90
1E+08	Gm2016	predicted gene 2016	43	46	43
56868	Psg23	pregnancy-specific glycoprotein 23	114	110	114
19125	Prodh	proline dehydrogenase	91	96	91
56742	Psrc1	proline/serine-rich coiled-coil 1	61	56	61
52830	Pnrc2	proline-rich nuclear receptor coactivator 2	48	54	48
19214	Ptgdr	prostaglandin D receptor	335	343	335
19119	Prm2	protamine 2	6	9	6
22072	Prss2	protease, serine, 2	186	179	186
19192	Psme3	proteasome (prosome, macropain) 28 subunit, 3	31	27	31
26441	Psma4	proteasome (prosome, macropain) subunit, alpha type 4	41	47	41
19175	Psmb6	proteasome (prosome, macropain) subunit, beta type 6	28	25	28
16913	Psmb8	proteasome (prosome, macropain) subunit, beta type 8 (large)	22	17	22
214572	Prmt7	protein arginine N-methyltransferase 7	166	157	166
19123	Proc	protein C	121	125	121
75292	Prkd3	protein kinase D3	157	159	157
242083	Ppm1l	protein phosphatase 1 (formerly 2C)-like	485	490	485
218232	Ptpdc1	protein tyrosine phosphatase domain containing 1	170	163	170
19262	Ptptra	protein tyrosine phosphatase, receptor type, A	178	174	178
19267	Ptpre	protein tyrosine phosphatase, receptor type, E	49	51	49
18823	Plp1	proteolipid protein (myelin) 1	110	108	110
18438	P2rx4	purinergic receptor P2X, ligand-gated ion channel 4	185	171	185
19352	Rabggtb	RAB geranylgeranyl transferase, b subunit	49	43	49
19326	Rab11b	RAB11B, member RAS oncogene family	78	80	78
19335	Rab23	RAB23, member RAS oncogene family	117	109	117
19349	Rab7	RAB7, member RAS oncogene family	136	131	136
231724	Rad9b	RAD9 homolog B (<i>S. cerevisiae</i>)	92	94	92
80837	Rhoj	ras homolog gene family, member J	303	308	303
57782	Rbak	RB-associated KRAB repressor	86	89	86
269400	Rtel1	regulator of telomere elongation helicase 1	66	68	66
19702	Ren2	renin 2 tandem duplication of Ren1	32	29	32
19889	Rp2h	retinitis pigmentosa 2 homolog (human)	198	208	198
20181	Rxra	retinoid X receptor alpha	459	453	459
19683	Rdh16	retinol dehydrogenase 16	64	60	64
71336	Rbks	ribokinase	111	107	111
54364	Rpp30	ribonuclease P/MRP 30 subunit (human)	85	80	85

68028	Rpl22l1	ribosomal protein L22 like 1	139	133	139
19988	Rpl6	ribosomal protein L6	259	244	259
20054	Rps15	ribosomal protein S15	45	42	45
66481	Rps21	ribosomal protein S21	41	43	41
20112	Rps6ka2	ribosomal protein S6 kinase, polypeptide 2	388	382	388
238323	Rps6kl1	ribosomal protein S6 kinase-like 1	83	88	83
76927	1700021C14Rik	RIKEN cDNA 1700021C14 gene	60	53	60
381406	2810408M09Rik	RIKEN cDNA 2810408M09 gene	38	40	38
321000	4933421E11Rik	RIKEN cDNA 4933421E11 gene	344	367	344
19656	Rbmxrt	RNA binding motif protein, X chromosome retrogene	94	92	94
76246	Rtf1	Rtf1, Paf1/RNA polymerase II complex component, homolog	104	101	104
56505	Ruvbl1	RuvB-like protein 1	95	92	95
20193	S100a1	S100 calcium binding protein A1	6	8	6
78891	Scyl1	SCY1-like 1 (<i>S. cerevisiae</i>)	77	80	77
211006	Sepsecs	Sep (O-phosphoserine) tRNA:Sec (selenocysteine) tRNA sy	218	223	218
54402	Stk19	serine/threonine kinase 19	18	14	18
53416	Stk39	serine/threonine kinase 39, STE20/SPS1 homolog (yeast)	603	589	603
58231	Stk4	serine/threonine kinase 4	127	131	127
58172	Sertad2	SERTA domain containing 2	493	501	493
29871	Scmh1	sex comb on midleg homolog 1	315	321	315
50721	Sirt6	sirtuin 6 (silent mating type information regulation 2, homolog)	28	25	28
76793	Snip1	Smad nuclear interacting protein 1	23	26	23
66618	Snrnp27	small nuclear ribonucleoprotein 27 (U4/U6.U5)	88	86	88
50817	Solh	small optic lobes homolog (<i>Drosophila</i>)	92	88	92
26459	Slc27a5	solute carrier family 27 (fatty acid transporter), member 5	44	42	44
56381	Spen	SPEN homolog, transcriptional regulator (<i>Drosophila</i>)	129	126	129
20690	Spam1	sperm adhesion molecule 1	142	139	142
20598	Smpd2	sphingomyelin phosphodiesterase 2, neutral	17	14	17
101943	Sf3b3	splicing factor 3b, subunit 3	12	10	12
71514	Sfpq	splicing factor proline/glutamine rich (polypyrimidine tract binding protein)	122	119	122
77799	Sla2	Src-like-adaptor 2	168	160	168
20667	Sox12	SRY-box containing gene 12	45	42	45
59045	Stard3	START domain containing 3	43	41	43
57357	Srd5a3	steroid 5 alpha-reductase 3	174	183	174
20788	Srebf2	sterol regulatory element binding factor 2	91	93	91
66234	Sc4mol	sterol-C4-methyl oxidase-like	228	231	228
67241	Smc6	structural maintenance of chromosomes 6	212	225	212
56362	Sult1b1	sulfotransferase family 1B, member 1	97	94	97
80886	Senp3	SUMO/sentrin specific peptidase 3	16	12	16
108077	Skiv2l	superkiller viralicidic activity 2-like (<i>S. cerevisiae</i>)	17	15	17
72195	Supt7l	suppressor of Ty 7 (<i>S. cerevisiae</i>)-like	42	46	42
52615	Suz12	suppressor of zeste 12 homolog (<i>Drosophila</i>)	158	165	158
77647	Trat1	T cell receptor associated transmembrane adaptor 1	490	486	490
228980	Taf4a	TAF4A RNA polymerase II, TATA box binding protein (TBP)	693	672	693
69714	Tfpt	TCF3 (E2A) fusion partner	16	12	16
73542	Tssk5	testis-specific serine kinase 5	15	11	15
22116	Tsks	testis-specific serine kinase substrate	60	49	60
66073	Txndc12	thioredoxin domain containing 12 (endoplasmic reticulum)	19	22	19
52700	Txndc17	thioredoxin domain containing 17	11	16	11
50493	Txnrd1	thioredoxin reductase 1	107	102	107
71807	Tars2	threonyl-tRNA synthetase 2, mitochondrial (putative)	105	109	105
21828	Thbs4	thrombospondin 4	299	304	299

22034	Traf6	TNF receptor-associated factor 6	197	194	197
21975	Top3a	topoisomerase (DNA) III alpha	70	66	70
106529	Tecr	trans-2,3-enoyl-CoA reductase	54	50	54
21423	Tcf3	transcription factor 3	109	107	109
213773	Tbl3	transducin (beta)-like 3	29	31	29
17246	Mdm2	transformed mouse 3T3 cell double minute 2	150	159	150
66525	Timm50	translocase of inner mitochondrial membrane 50 homolog (y	50	45	50
74140	Tm9sf1	transmembrane 9 superfamily member 1	16	18	16
140765	Tmprss3	transmembrane protease, serine 3	58	61	58
21991	Tpi1	triosephosphate isomerase 1	24	28	24
74691	Tdrd9	tudor domain containing 9	19	21	19
326623	Tnfsf15	tumor necrosis factor (ligand) superfamily, member 15	310	317	310
230979	Tnfrsf14	tumor necrosis factor receptor superfamily, member 14 (herp	81	83	81
22160	Twist1	twist homolog 1 (Drosophila)	753	765	753
22629	Ywhah	tyrosine 3-monooxygenase/tryptophan 5-monooxygenase a	317	310	317
107271	Yars	tyrosyl-tRNA synthetase	78	73	78
66152	Uqcr10	ubiquinol-cytochrome c reductase, complex III subunit X	91	88	91
93841	Uchl4	ubiquitin carboxyl-terminal esterase L4	92	99	92
22192	Ube2m	ubiquitin-conjugating enzyme E2M (UBC12 homolog, yeast)	22	17	22
22238	Ugt2b5	UDP glucuronosyltransferase 2 family, polypeptide B5	209	213	209
67205	Utp11	UTP11-like, U3 small nucleolar ribonucleoprotein, (yeast)	59	57	59
65961	Utp3	UTP3, small subunit (SSU) processome component, homolo	63	67	63
28084	Vps25	vacuolar protein sorting 25 (yeast)	17	22	17
270097	Vat1l	vesicle amine transport protein 1 homolog-like (T. californica	362	360	362
22337	Vdr	vitamin D receptor	143	154	143
77305	Wdr82	WD repeat domain containing 82	24	26	24
22409	Wnt10a	wingless related MMTV integration site 10a	95	90	95
216795	Wnt9a	wingless-type MMTV integration site 9A	105	91	105
73680	Zbtb8a	zinc finger and BTB domain containing 8a	139	136	139
269800	Zfp384	zinc finger protein 384	56	51	56
100515	Zfp518b	zinc finger protein 518B	410	388	410
319601	Zfp653	zinc finger protein 653	45	40	45
319748	Zfp865	zinc finger protein 865	27	25	27
99334	Zscan29	zinc finger SCAN domains 29	34	39	34
67235	Zkscan14	zinc finger with KRAB and SCAN domains 14	16	19	16
1E+08	Zkscan16	zinc finger with KRAB and SCAN domains 16	96	104	96
22757	Zkscan5	zinc finger with KRAB and SCAN domains 5	41	38	41